



Analytical Laboratory

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13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number: J12120066

Project Name: Flex Fuel WW

Customer Name(s): Bill K, Wayne C, Melonie M, and Tom J

Customer Address: 3195 Pine Hall Rd
Mailcode: Belews Steam Station
Belews Creek, NC 28012

Lab Contact: Jason C Perkins Phone: 980-875-5348

Report Authorized By: _____ **Date:** 12/28/2012
(Signature)

Program Comments:

Please contact the Program Manager (Jason C Perkins) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2012025802	BELEWS	03-Dec-12 7:00 AM	L. TURNER	FGD Purge Eff
2012025803	BELEWS	03-Dec-12 7:33 AM	L. TURNER	EQ TANK
2012025804	BELEWS	03-Dec-12 7:40 AM	L. TURNER	BIOREACTOR 1 INF
2012025805	BELEWS	03-Dec-12 7:40 AM	L. TURNER	biOREACTOR 1 INF HG BLK
2012025806	BELEWS	03-Dec-12 7:45 AM	L. TURNER	BIOREACTOR 2 INF.
2012025807	BELEWS	03-Dec-12 7:45 AM	L. TURNER	BIOREACTOR 2 INF. HG BLANK
2012025808	BELEWS	03-Dec-12 7:50 AM	L. TURNER	BIOREACTOR 2 EFF.
2012025809	BELEWS	03-Dec-12 7:50 AM	L. TURNER	BIOREACTOR 2 EFF. HG BLANK
2012025810	BELEWS	03-Dec-12 7:55 AM	L. TURNER	FILTER BLANK
9 Total Samples				

Technical Validation Review

Checklist:

- | | | |
|--|---|--|
| COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures). | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| All Results are less than the laboratory reporting limits. | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| All laboratory QA/QC requirements are acceptable. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

Report Sections Included:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Job Summary Report | <input checked="" type="checkbox"/> Sub-contracted Laboratory Results |
| <input checked="" type="checkbox"/> Sample Identification | <input type="checkbox"/> Customer Specific Data Sheets, Reports, & Documentation |
| <input checked="" type="checkbox"/> Technical Validation of Data Package | <input type="checkbox"/> Customer Database Entries |
| <input checked="" type="checkbox"/> Analytical Laboratory Certificate of Analysis | <input checked="" type="checkbox"/> Chain of Custody |
| <input type="checkbox"/> Analytical Laboratory QC Report | <input checked="" type="checkbox"/> Electronic Data Deliverable (EDD) Sent Separately |

Reviewed By: DBA Account

Date: 12/28/2012

Certificate of Laboratory Analysis

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*This report shall not be reproduced, except in full.***Order # J12120066**

Site: FGD Purge Eff

Collection Date: 03-Dec-12 7:00 AM

Sample #: 2012025802

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>INORGANIC IONS BY IC</u>								
Bromide	110	mg/L		5	50	EPA 300.0	12/21/2012 15:47	JAHERMA
Chloride	7800	mg/L		100	1000	EPA 300.0	12/21/2012 15:47	JAHERMA
Sulfate	1300	mg/L		100	1000	EPA 300.0	12/21/2012 15:47	JAHERMA
<u>MERCURY (COLD VAPOR) IN WATER</u>								
Mercury (Hg)	179	ug/L		5	100	EPA 245.1	12/13/2012 13:57	AGIBBS
<u>DISSOLVED METALS BY ICP</u>								
Manganese (Mn)	12.1	mg/L		0.05	10	EPA 200.7	12/13/2012 09:59	MHH7131
<u>TOTAL RECOVERABLE METALS BY ICP</u>								
Boron (B)	210	mg/L		0.5	10	EPA 200.7	12/10/2012 14:38	MHH7131
Calcium (Ca)	4560	mg/L		0.1	10	EPA 200.7	12/10/2012 14:38	MHH7131
Iron (Fe)	149	mg/L		0.1	10	EPA 200.7	12/10/2012 14:38	MHH7131
Magnesium (Mg)	1060	mg/L		0.05	10	EPA 200.7	12/10/2012 14:38	MHH7131
Manganese (Mn)	13.1	mg/L		0.05	10	EPA 200.7	12/10/2012 14:38	MHH7131
<u>DISSOLVED METALS BY ICP-MS</u>								
Selenium (Se)	216	ug/L		10	10	EPA 200.8	12/12/2012 11:27	KRICHAR
<u>TOTAL RECOVERABLE METALS BY ICP-MS</u>								
Arsenic (As)	297	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Cadmium (Cd)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Chromium (Cr)	329	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Copper (Cu)	155	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Nickel (Ni)	260	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Selenium (Se)	3150	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Silver (Ag)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
Zinc (Zn)	316	ug/L		10	10	EPA 200.8	12/12/2012 15:19	KRICHAR
<u>SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)</u>								
Vendor Parameter	Complete					Vendor Method	V_AS&C	
<u>TOTAL DISSOLVED SOLIDS</u>								
TDS	25000	mg/L		200	1	SM2540C	12/10/2012 16:47	SWILLI3
<u>TOTAL SUSPENDED SOLIDS</u>								
TSS	4100	mg/L		250	1	SM2540D	12/07/2012 11:15	TJA7067

Certificate of Laboratory Analysis

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*This report shall not be reproduced, except in full.***Order # J12120066**

Site: EQ TANK

Collection Date: 03-Dec-12 7:33 AM

Sample #: 2012025803

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>MERCURY (COLD VAPOR) IN WATER</u>								
Mercury (Hg)	86.1	ug/L		2.5	50	EPA 245.1	12/13/2012 14:00	AGIBBS
<u>DISSOLVED METALS BY ICP</u>								
Manganese (Mn)	11.7	mg/L		0.05	10	EPA 200.7	12/13/2012 10:02	MHH7131
<u>TOTAL RECOVERABLE METALS BY ICP</u>								
Boron (B)	222	mg/L		0.5	10	EPA 200.7	12/10/2012 14:42	MHH7131
Calcium (Ca)	4090	mg/L		0.1	10	EPA 200.7	12/10/2012 14:42	MHH7131
Iron (Fe)	85.1	mg/L		0.1	10	EPA 200.7	12/10/2012 14:42	MHH7131
Magnesium (Mg)	1050	mg/L		0.05	10	EPA 200.7	12/10/2012 14:42	MHH7131
Manganese (Mn)	12.1	mg/L		0.05	10	EPA 200.7	12/10/2012 14:42	MHH7131
<u>DISSOLVED METALS BY ICP-MS</u>								
Selenium (Se)	222	ug/L		10	10	EPA 200.8	12/12/2012 11:30	KRICHAR
<u>TOTAL RECOVERABLE METALS BY ICP-MS</u>								
Arsenic (As)	173	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Cadmium (Cd)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Chromium (Cr)	204	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Copper (Cu)	100.0	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Nickel (Ni)	215	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Selenium (Se)	2020	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Silver (Ag)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR
Zinc (Zn)	210	ug/L		10	10	EPA 200.8	12/12/2012 15:36	KRICHAR

Site: BIOREACTOR 1 INF

Collection Date: 03-Dec-12 7:40 AM

Sample #: 2012025804

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)</u>								
Vendor Parameter	Complete					Vendor Method		V_BRAND
<u>DISSOLVED METALS BY ICP</u>								
Manganese (Mn)	3.96	mg/L		0.05	10	EPA 200.7	12/13/2012 10:06	MHH7131
<u>TOTAL RECOVERABLE METALS BY ICP</u>								
Boron (B)	214	mg/L		0.5	10	EPA 200.7	12/10/2012 14:46	MHH7131
Calcium (Ca)	3710	mg/L		0.1	10	EPA 200.7	12/10/2012 14:46	MHH7131
Iron (Fe)	< 0.1	mg/L		0.1	10	EPA 200.7	12/10/2012 14:46	MHH7131
Magnesium (Mg)	950	mg/L		0.05	10	EPA 200.7	12/10/2012 14:46	MHH7131
Manganese (Mn)	3.95	mg/L		0.05	10	EPA 200.7	12/10/2012 14:46	MHH7131

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*This report shall not be reproduced, except in full.***Order # J12120066**

Site: BIOREACTOR 1 INF

Collection Date: 03-Dec-12 7:40 AM

Sample #: 2012025804

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>DISSOLVED METALS BY ICP-MS</u>								
Selenium (Se)	106	ug/L		10	10	EPA 200.8	12/12/2012 11:33	KRICHAR
<u>TOTAL RECOVERABLE METALS BY ICP-MS</u>								
Arsenic (As)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Cadmium (Cd)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Chromium (Cr)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Copper (Cu)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Nickel (Ni)	29.3	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Selenium (Se)	87.9	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Silver (Ag)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR
Zinc (Zn)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:26	KRICHAR

SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)

Vendor Parameter	Complete	Vendor Method	V_AS&C
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Site: biOREACTOR 1 INF HG BLK

Collection Date: 03-Dec-12 7:40 AM

Sample #: 2012025805

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)</u>								
Vendor Parameter	Complete					Vendor Method		V_BRAND

Site: BIOREACTOR 2 INF.

Collection Date: 03-Dec-12 7:45 AM

Sample #: 2012025806

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)</u>								
Vendor Parameter	Complete					Vendor Method		V_BRAND
<u>DISSOLVED METALS BY ICP</u>								
Manganese (Mn)	3.24	mg/L		0.05	10	EPA 200.7	12/13/2012 10:10	MHH7131
<u>TOTAL RECOVERABLE METALS BY ICP</u>								
Boron (B)	217	mg/L		0.5	10	EPA 200.7	12/10/2012 14:50	MHH7131
Calcium (Ca)	3770	mg/L		0.1	10	EPA 200.7	12/10/2012 14:50	MHH7131
Iron (Fe)	0.228	mg/L		0.1	10	EPA 200.7	12/10/2012 14:50	MHH7131
Magnesium (Mg)	936	mg/L		0.05	10	EPA 200.7	12/10/2012 14:50	MHH7131
Manganese (Mn)	3.16	mg/L		0.05	10	EPA 200.7	12/10/2012 14:50	MHH7131

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*This report shall not be reproduced, except in full.***Order # J12120066**

Site: BIOREACTOR 2 INF.

Collection Date: 03-Dec-12 7:45 AM

Sample #: 2012025806

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>DISSOLVED METALS BY ICP-MS</u>								
Selenium (Se)	14.5	ug/L		10	10	EPA 200.8	12/12/2012 11:37	KRICHAR
<u>TOTAL RECOVERABLE METALS BY ICP-MS</u>								
Arsenic (As)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Cadmium (Cd)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Chromium (Cr)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Copper (Cu)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Nickel (Ni)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Selenium (Se)	18.4	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Silver (Ag)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR
Zinc (Zn)	< 10	ug/L		10	10	EPA 200.8	12/12/2012 15:30	KRICHAR

SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)

Vendor Parameter	Complete	Vendor Method	V_AS&C
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Site: BIOREACTOR 2 INF. HG BLANK

Collection Date: 03-Dec-12 7:45 AM

Sample #: 2012025807

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)</u>								
Vendor Parameter	Complete					Vendor Method		V_BRAND

Site: BIOREACTOR 2 EFF.

Collection Date: 03-Dec-12 7:50 AM

Sample #: 2012025808

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>INORGANIC IONS BY IC</u>								
Bromide	110	mg/L		5	50	EPA 300.0	12/21/2012 16:06	JAHERMA
Chloride	8300	mg/L		100	1000	EPA 300.0	12/21/2012 16:06	JAHERMA
Sulfate	1600	mg/L		100	1000	EPA 300.0	12/21/2012 16:06	JAHERMA
<u>MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)</u>								
Vendor Parameter	Complete					Vendor Method		V_BRAND
<u>DISSOLVED METALS BY ICP</u>								
Manganese (Mn)	2.84	mg/L		0.05	10	EPA 200.7	12/13/2012 10:14	MHH7131

Certificate of Laboratory Analysis

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*This report shall not be reproduced, except in full.***Order # J12120066**

Site: BIOREACTOR 2 EFF.

Collection Date: 03-Dec-12 7:50 AM

Sample #: 2012025808

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>TOTAL RECOVERABLE METALS BY ICP</u>								
Boron (B)	215	mg/L		0.5	10	EPA 200.7	12/10/2012 14:54	MHH7131
Calcium (Ca)	3850	mg/L		0.1	10	EPA 200.7	12/10/2012 14:54	MHH7131
Iron (Fe)	< 0.1	mg/L		0.1	10	EPA 200.7	12/10/2012 14:54	MHH7131
Magnesium (Mg)	926	mg/L		0.05	10	EPA 200.7	12/10/2012 14:54	MHH7131
Manganese (Mn)	2.89	mg/L		0.05	10	EPA 200.7	12/10/2012 14:54	MHH7131
<u>DISSOLVED METALS BY ICP-MS</u>								
Selenium (Se)	9.34	ug/L		5	5	EPA 200.8	12/12/2012 11:40	KRICHAR
<u>TOTAL RECOVERABLE METALS BY ICP-MS</u>								
Arsenic (As)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Cadmium (Cd)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Chromium (Cr)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Copper (Cu)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Nickel (Ni)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Selenium (Se)	10.1	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Silver (Ag)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
Zinc (Zn)	< 5	ug/L		5	5	EPA 200.8	12/12/2012 15:33	KRICHAR
<u>SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)</u>								
Vendor Parameter	Complete					Vendor Method	V_AS&C	

Site: BIOREACTOR 2 EFF. HG BLANK

Collection Date: 03-Dec-12 7:50 AM

Sample #: 2012025809

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)</u>								
Vendor Parameter	Complete					Vendor Method	V_BRAND	

Site: FILTER BLANK

Collection Date: 03-Dec-12 7:55 AM

Sample #: 2012025810

Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
<u>DISSOLVED METALS BY ICP</u>								
Manganese (Mn)	0.038	mg/L		0.005	1	EPA 200.7	12/13/2012 09:35	MHH7131
<u>DISSOLVED METALS BY ICP-MS</u>								
Selenium (Se)	< 1	ug/L		1	1	EPA 200.8	12/12/2012 11:08	KRICHAR



**APPLIED SPECIATION
AND CONSULTING, LLC**

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

December 17, 2012

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078
(704) 875-5245

Project: Belews Creek (Flex Fuel) – WW (LIMS #J12120066)

Dear Mr. Perkins,

Attached is the report associated with four (4) aqueous samples submitted for selenium speciation on December 6, 2012. The samples were received in a sealed cooler at -0.3°C on December 7, 2012. Selenium speciation analysis was performed via ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Any issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell Gerads", written over a light blue horizontal line.

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report prepared for:

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078

Project: Belews Creek (Flex Fuel) – WW (LIMS #J12120066)

December 17, 2012

1. Sample Reception

Four (4) aqueous samples in 125mL HDPE bottles (provided by Applied Speciation and Consulting) were submitted for selenium speciation analysis on December 6, 2012. The samples were received on December 7, 2012 in a sealed container at -0.3°C.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and were designated discrete sample identifiers. An aliquot of each sample was filtered (0.45µm) and each filtrate was stored in a secure, monitored cryofreezer (maintained at a temperature of -80°C) until selenium speciation analysis could be performed via ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS).

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Selenium Speciation Analysis by IC-ICP-DRC-MS Prior to analysis, an aliquot of each sample was filtered with a syringe filter (0.45µm) and injected directly into an autosampler vial. No further sample preparation was performed as any chemical alteration of a sample may shift the equilibrium of the system, resulting in changes in speciation ratios.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of

each analytical day. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Selenium Speciation Analysis by IC-ICP-DRC-MS Each sample for selenium speciation analysis was analyzed by ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS) on December 13, 2012. An aliquot of each sample is injected onto an anion exchange column and mobilized by a basic ($\text{pH} > 7$) gradient. The eluting selenium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a reaction gas which preferentially reacts with interfering ions of the same target mass to charge ratios (m/z). A solid-state detector detects ions transmitted through the mass analyzer and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

The overall analyses went well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits.

The estimated method detection limits (eMDLs) for selenite, selenate, and selenocyanate are generated from replicate analyses of the lowest standard in the calibration curve. Not all selenium species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks are artificially biased low.

The eMDL for methylseleninic acid and selenomethionine is calculated from the average eMDL of selenite, selenate, and selenocyanate. The calibration does not contain methylseleninic acid or selenomethionine due to impurities in these standards which would bias the results for other selenium species.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Russell Gerads', with a stylized, sweeping flourish extending to the right.

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Selenium Speciation Results for Duke Energy
 Project Name: Belews Creek (Flex Fuel) - WW
 Contact: Jay Perkins
 LIMS #J12120066

Date: December 17, 2012
 Report Generated by: Russell Gerads
 Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Se(IV)	Se(VI)	SeCN	MeSe(IV)	SeMe	Unknown Se Species (n)
FGD Purge Eff	145	45.1	ND (<0.63)	4.44	ND (<0.83)	0.0 (0)
BioReactor 1 Inf	23.1	44.1	ND (<0.16)	5.04	ND (<0.21)	4.12 (1)
BioReactor 2 Inf	0.93	1.13	0.67	ND (<0.21)	ND (<0.21)	0.0 (0)
BioReactor 2 Eff	0.18	ND (<0.29)	ND (<0.16)	ND (<0.21)	ND (<0.21)	0.0 (0)

All results reflect the applied dilution and are reported in µg/L

ND = Not detected at the applied dilution

SeCN = Selenocyanate

MeSe(IV) = Methylseleninic acid

SeMe = Selenomethionine

Unknown Se Species = Total concentration of all unknown Se species observed by IC-ICP-MS

Selenium Speciation Results for Duke Energy
 Project Name: Belews Creek (Flex Fuel) - WW
 Contact: Jay Perkins
 LIMS #J12120066

Date: December 17, 2012
 Report Generated by: Russell Gerads
 Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL*	eMDL 50x	eMDL 200x
Se(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.17	0.70
Se(VI)	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.29	1.2
SeCN	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.16	0.63
MeSe(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.21	0.83
SeMe	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.21	0.83

eMDL = Estimated Method Detection Limit

*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte (µg/L)	CRM	True Value	Result	Recovery
Se(IV)	LCS	9.57	10.09	105.4
Se(VI)	LCS	9.48	9.58	101.0
SeCN	LCS	8.92	9.00	100.9
MeSe(IV)	LCS	6.47	6.58	101.7
SeMe	LCS	9.32	9.54	102.4

Selenium Speciation Results for Duke Energy
 Project Name: Belews Creek (Flex Fuel) - WW
 Contact: Jay Perkins
 LIMS #J12120066

Date: December 17, 2012
 Report Generated by: Russell Gerads
 Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicates

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Se(IV)	BioReactor 2 Inf	0.93	0.94	0.94	1.4
Se(VI)	BioReactor 2 Inf	1.13	1.25	1.19	9.9
SeCN	BioReactor 2 Inf	0.67	0.71	0.69	5.9
MeSe(IV)	BioReactor 2 Inf	ND (<0.21)	ND (<0.21)	NC	NC
SeMe	BioReactor 2 Inf	ND (<0.21)	ND (<0.21)	NC	NC

ND = Not detected at the applied dilution

NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Se(IV)	BioReactor 2 Inf	278.0	287.5	103.1	278.0	290.9	104.3	1.2
Se(VI)	BioReactor 2 Inf	252.3	256.2	101.1	252.3	257.6	101.6	0.5
SeCN	BioReactor 2 Inf	228.8	232.7	101.4	228.8	232.8	101.5	0.0

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Mail Code MGO3A2 (Building 7405) 13339 Hagers Ferry Rd Huntersville, N. C. 28078 (704) 875-5245 Fax: (704) 875-4349		Duke Energy Analytical Laboratory Mail Code MGO3A2 (Building 7405) 13339 Hagers Ferry Rd Huntersville, N. C. 28078 (704) 875-5245 Fax: (704) 875-4349	
1) Project Name	Belews Creek (Flex Fuel) - WW	2) Phone No:	
2) Client:	Melanie Martin, Wayne Chapman, Tom Johnson, Bill Kennedy	4) Fax No:	
5) Project:	MBCFFLX01	6) Account:	
8) Oper. Unit:	BC01	9) Process:	NEXHSTK

LIMS # 312120066 Date & Time 12-4-12 10:21 Vendor Brooks Rand		Matrix: OTHER Samples Originating From NC SC	
Logged By cpt Date & Time 12-4-12 10:21 Vendor Brooks Rand		SAMPLE PROGRAM NPDES Drinking Water UST Ground Water RCRA	

1) Project Name	Belews Creek (Flex Fuel) - WW	2) Phone No:	
2) Client:	Melanie Martin, Wayne Chapman, Tom Johnson, Bill Kennedy	4) Fax No:	
5) Project:	MBCFFLX01	6) Account:	
8) Oper. Unit:	BC01	9) Process:	NEXHSTK

LIMS # 312120066 Date & Time 12-4-12 10:21 Vendor Brooks Rand		Matrix: OTHER Samples Originating From NC SC	
Logged By cpt Date & Time 12-4-12 10:21 Vendor Brooks Rand		SAMPLE PROGRAM NPDES Drinking Water UST Ground Water RCRA	

LAB USE ONLY	11) Lab ID
201202-5804	03
04	05
06	07
08	09
10	

Se Speciation Bottle ID	13 Sample Description or ID	Date	Time	Signature
	FGD Purge Eff	12-3	0700	Lawrence
	EQ Tank		0735	
	BioReactor 1 Inf		0740	
	BioReactor 1 Inf Hg Blk		0740	
	BioReactor 2 Inf		0745	
	BioReactor 2 Inf Hg Blk		0745	
	BioReactor 2 Eff		0750	
	BioReactor 2 Eff Hg Blk		0750	
	Filter Blank		0755	

16 Analyses	17 Comp.	18 Grab	19 TSS	20 TDS	21 TSS	22 TDS	23 TSS	24 TDS	25 TSS	26 TDS	27 TSS	28 TDS	29 TSS	30 TDS	31 TSS	32 TDS	33 TSS	34 TDS	35 TSS	36 TDS	37 TSS	38 TDS	39 TSS	40 TDS	41 TSS	42 TDS	43 TSS	44 TDS	45 TSS	46 TDS	47 TSS	48 TDS	49 TSS	50 TDS	51 TSS	52 TDS	53 TSS	54 TDS	55 TSS	56 TDS	57 TSS	58 TDS	59 TSS	60 TDS	61 TSS	62 TDS	63 TSS	64 TDS	65 TSS	66 TDS	67 TSS	68 TDS	69 TSS	70 TDS	71 TSS	72 TDS	73 TSS	74 TDS	75 TSS	76 TDS	77 TSS	78 TDS	79 TSS	80 TDS	81 TSS	82 TDS	83 TSS	84 TDS	85 TSS	86 TDS	87 TSS	88 TDS	89 TSS	90 TDS	91 TSS	92 TDS	93 TSS	94 TDS	95 TSS	96 TDS	97 TSS	98 TDS	99 TSS	100 TDS	101 TSS	102 TDS	103 TSS	104 TDS	105 TSS	106 TDS	107 TSS	108 TDS	109 TSS	110 TDS	111 TSS	112 TDS	113 TSS	114 TDS	115 TSS	116 TDS	117 TSS	118 TDS	119 TSS	120 TDS	121 TSS	122 TDS	123 TSS	124 TDS	125 TSS	126 TDS	127 TSS	128 TDS	129 TSS	130 TDS	131 TSS	132 TDS	133 TSS	134 TDS	135 TSS	136 TDS	137 TSS	138 TDS	139 TSS	140 TDS	141 TSS	142 TDS	143 TSS	144 TDS	145 TSS	146 TDS	147 TSS	148 TDS	149 TSS	150 TDS	151 TSS	152 TDS	153 TSS	154 TDS	155 TSS	156 TDS	157 TSS	158 TDS	159 TSS	160 TDS	161 TSS	162 TDS	163 TSS	164 TDS	165 TSS	166 TDS	167 TSS	168 TDS	169 TSS	170 TDS	171 TSS	172 TDS	173 TSS	174 TDS	175 TSS	176 TDS	177 TSS	178 TDS	179 TSS	180 TDS	181 TSS	182 TDS	183 TSS	184 TDS	185 TSS	186 TDS	187 TSS	188 TDS	189 TSS	190 TDS	191 TSS	192 TDS	193 TSS	194 TDS	195 TSS	196 TDS	197 TSS	198 TDS	199 TSS	200 TDS	201 TSS	202 TDS	203 TSS	204 TDS	205 TSS	206 TDS	207 TSS	208 TDS	209 TSS	210 TDS	211 TSS	212 TDS	213 TSS	214 TDS	215 TSS	216 TDS	217 TSS	218 TDS	219 TSS	220 TDS	221 TSS	222 TDS	223 TSS	224 TDS	225 TSS	226 TDS	227 TSS	228 TDS	229 TSS	230 TDS	231 TSS	232 TDS	233 TSS	234 TDS	235 TSS	236 TDS	237 TSS	238 TDS	239 TSS	240 TDS	241 TSS	242 TDS	243 TSS	244 TDS	245 TSS	246 TDS	247 TSS	248 TDS	249 TSS	250 TDS	251 TSS	252 TDS	253 TSS	254 TDS	255 TSS	256 TDS	257 TSS	258 TDS	259 TSS	260 TDS	261 TSS	262 TDS	263 TSS	264 TDS	265 TSS	266 TDS	267 TSS	268 TDS	269 TSS	270 TDS	271 TSS	272 TDS	273 TSS	274 TDS	275 TSS	276 TDS	277 TSS	278 TDS	279 TSS	280 TDS	281 TSS	282 TDS	283 TSS	284 TDS	285 TSS	286 TDS	287 TSS	288 TDS	289 TSS	290 TDS	291 TSS	292 TDS	293 TSS	294 TDS	295 TSS	296 TDS	297 TSS	298 TDS	299 TSS	300 TDS	301 TSS	302 TDS	303 TSS	304 TDS	305 TSS	306 TDS	307 TSS	308 TDS	309 TSS	310 TDS	311 TSS	312 TDS	313 TSS	314 TDS	315 TSS	316 TDS	317 TSS	318 TDS	319 TSS	320 TDS	321 TSS	322 TDS	323 TSS	324 TDS	325 TSS	326 TDS	327 TSS	328 TDS	329 TSS	330 TDS	331 TSS	332 TDS	333 TSS	334 TDS	335 TSS	336 TDS	337 TSS	338 TDS	339 TSS	340 TDS	341 TSS	342 TDS	343 TSS	344 TDS	345 TSS	346 TDS	347 TSS	348 TDS	349 TSS	350 TDS	351 TSS	352 TDS	353 TSS	354 TDS	355 TSS	356 TDS	357 TSS	358 TDS	359 TSS	360 TDS	361 TSS	362 TDS	363 TSS	364 TDS	365 TSS	366 TDS	367 TSS	368 TDS	369 TSS	370 TDS	371 TSS	372 TDS	373 TSS	374 TDS	375 TSS	376 TDS	377 TSS	378 TDS	379 TSS	380 TDS	381 TSS	382 TDS	383 TSS	384 TDS	385 TSS	386 TDS	387 TSS	388 TDS	389 TSS	390 TDS	391 TSS	392 TDS	393 TSS	394 TDS	395 TSS	396 TDS	397 TSS	398 TDS	399 TSS	400 TDS	401 TSS	402 TDS	403 TSS	404 TDS	405 TSS	406 TDS	407 TSS	408 TDS	409 TSS	410 TDS	411 TSS	412 TDS	413 TSS	414 TDS	415 TSS	416 TDS	417 TSS	418 TDS	419 TSS	420 TDS	421 TSS	422 TDS	423 TSS	424 TDS	425 TSS	426 TDS	427 TSS	428 TDS	429 TSS	430 TDS	431 TSS	432 TDS	433 TSS	434 TDS	435 TSS	436 TDS	437 TSS	438 TDS	439 TSS	440 TDS	441 TSS	442 TDS	443 TSS	444 TDS	445 TSS	446 TDS	447 TSS	448 TDS	449 TSS	450 TDS	451 TSS	452 TDS	453 TSS	454 TDS	455 TSS	456 TDS	457 TSS	458 TDS	459 TSS	460 TDS	461 TSS	462 TDS	463 TSS	464 TDS	465 TSS	466 TDS	467 TSS	468 TDS	469 TSS	470 TDS	471 TSS	472 TDS	473 TSS	474 TDS	475 TSS	476 TDS	477 TSS	478 TDS	479 TSS	480 TDS	481 TSS	482 TDS	483 TSS	484 TDS	485 TSS	486 TDS	487 TSS	488 TDS	489 TSS	490 TDS	491 TSS	492 TDS	493 TSS	494 TDS	495 TSS	496 TDS	497 TSS	498 TDS	499 TSS	500 TDS	501 TSS	502 TDS	503 TSS	504 TDS	505 TSS	506 TDS	507 TSS	508 TDS	509 TSS	510 TDS	511 TSS	512 TDS	513 TSS	514 TDS	515 TSS	516 TDS	517 TSS	518 TDS	519 TSS	520 TDS	521 TSS	522 TDS	523 TSS	524 TDS	525 TSS	526 TDS	527 TSS	528 TDS	529 TSS	530 TDS	531 TSS	532 TDS	533 TSS	534 TDS	535 TSS	536 TDS	537 TSS	538 TDS	539 TSS	540 TDS	541 TSS	542 TDS	543 TSS	544 TDS	545 TSS	546 TDS	547 TSS	548 TDS	549 TSS	550 TDS	551 TSS	552 TDS	553 TSS	554 TDS	555 TSS	556 TDS	557 TSS	558 TDS	559 TSS	560 TDS	561 TSS	562 TDS	563 TSS	564 TDS	565 TSS	566 TDS	567 TSS	568 TDS	569 TSS	570 TDS	571 TSS	572 TDS	573 TSS	574 TDS	575 TSS	576 TDS	577 TSS	578 TDS	579 TSS	580 TDS	581 TSS	582 TDS	583 TSS	584 TDS	585 TSS	586 TDS	587 TSS	588 TDS	589 TSS	590 TDS	591 TSS	592 TDS	593 TSS	594 TDS	595 TSS	596 TDS	597 TSS	598 TDS	599 TSS	600 TDS	601 TSS	602 TDS	603 TSS	604 TDS	605 TSS	606 TDS	607 TSS	608 TDS	609 TSS	610 TDS	611 TSS	612 TDS	613 TSS	614 TDS	615 TSS	616 TDS	617 TSS	618 TDS	619 TSS	620 TDS	621 TSS	622 TDS	623 TSS	624 TDS	625 TSS	626 TDS	627 TSS	628 TDS	629 TSS	630 TDS	631 TSS	632 TDS	633 TSS	634 TDS	635 TSS	636 TDS	637 TSS	638 TDS	639 TSS	640 TDS	641 TSS	642 TDS	643 TSS	644 TDS	645 TSS	646 TDS	647 TSS	648 TDS	649 TSS	650 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TSS	776 TDS	777 TSS	778 TDS	779 TSS	780 TDS	781 TSS	782 TDS	783 TSS	784 TDS	785 TSS	786 TDS	787 TSS	788 TDS	789 TSS	790 TDS	791 TSS	792 TDS	793 TSS	794 TDS	795 TSS	796 TDS	797 TSS	798 TDS	799 TSS	800 TDS	801 TSS	802 TDS	803 TSS	804 TDS	805 TSS	806 TDS	807 TSS	808 TDS	809 TSS	810 TDS	811 TSS	812 TDS	813 TSS	814 TDS	815 TSS	816 TDS	817 TSS	818 TDS	819 TSS	820 TDS	821 TSS	822 TDS	823 TSS	824 TDS	825 TSS	826 TDS	827 TSS	828 TDS	829 TSS	830 TDS	831 TSS	832 TDS	833 TSS	834 TDS	835 TSS	836 TDS	837 TSS	838 TDS	839 TSS	840 TDS	841 TSS	842 TDS	843 TSS	844 TDS	845 TSS	846 TDS	847 TSS	848 TDS	849 TSS	850 TDS	851 TSS	852 TDS	853 TSS	854 TDS	855 TSS	856 TDS	857 TSS	858 TDS	859 TSS	860 TDS	861 TSS	862 TDS	863 TSS	864 TDS	865 TSS	866 TDS	867 TSS	868 TDS	869 TSS	870 TDS	871 TSS	872 TDS	873 TSS	874 TDS	875 TSS	876 TDS	877 TSS	878 TDS	879 TSS	880 TDS	881 TSS	882 TDS	883 TSS	884 TDS	885 TSS	886 TDS	887 TSS	888 TDS	889 TSS	890 TDS	891 TSS	892 TDS	893 TSS	894 TDS	895 TSS	896 TDS	897 TSS	898 TDS	899 TSS	900 TDS	901 TSS	902 TDS	903 TSS	904 TDS	905 TSS	906 TDS	907 TSS	908 TDS	909 TSS	910 TDS	911 TSS	912 TDS	913 TSS	914 TDS	915 TSS	916 TDS	917 TSS	918 TDS	919 TSS	920 TDS	921 TSS	922 TDS	923 TSS	924 TDS	925 TSS	926 TDS	927 TSS	928 TDS	929 TSS	930 TDS	931 TSS	932 TDS	933 TSS	934 TDS	935 TSS	936 TDS	937 TSS	938 TDS	939 TSS	940 TDS	941 TSS	942 TDS	943 TSS	944 TDS	945 TSS	946 TDS	947 TSS	948 TDS	949 TSS	950 TDS	951 TSS	952 TDS	953 TSS	954 TDS	955 TSS	956 TDS	957 TSS	958 TDS	959 TSS	960 TDS	961 TSS	962 TDS	963 TSS	964 TDS	965 TSS	966 TDS	967 TSS	9
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December 24, 2012

Duke Energy
ATTN: Jay Perkins
Scientific Support-Laboratory
13339 Hagers Ferry Road
Huntersville NC 28078
jcperkins@duke-energy.com
labcustomer@duke-energy.com

RE: Project DUK-HV1201

Client Project: J12120066

Dear Mr. Perkins,

On December 7, 2012, Brooks Rand Labs (BRL) received three (3) wastewater samples and three (3) associated field blanks. An aliquot was removed from each sample bottle and filtered into a separate container designed for dissolved mercury (Hg) analysis. The sample volume from the original container was logged-in for total Hg analysis. All samples were received, prepared, analyzed, and stored according to BRL SOPs and EPA methodology.

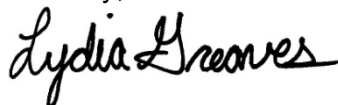
Data used for regulatory purposes has a 24 hour filtration holding time requirement. Non-regulatory purposed data has a 48 hour filtration holding time. The samples were received outside of the 48 hour filtration requirement and the results were qualified **H**.

The results were blank-corrected as described in the calculations section of the relevant SOP and may have been evaluated using reporting limits that have been adjusted to account for sample aliquot size. Please refer to the *Sample Results* page for sample-specific MDLs, MRLs, and other details. Aside from concentration qualifiers, all data was reported without further qualification and all associated quality control sample results met the acceptance criteria.

BRL, an accredited laboratory, certifies the reported results of all analyses for which BRL is NELAP accredited meet all NELAP requirements. For more details, see the *Report Information* page of the report.

Please feel free to contact us if you have any questions regarding this report.

Sincerely,



Lydia Greaves
Project Manager
lydia@brooksrands.com

Report Information

Laboratory Accreditation

BRL is accredited by the *National Environmental Laboratory Accreditation Program* (NELAP) through the State of Florida Department of Health, Bureau of Laboratories (E87982) and is certified to perform many environmental analyses. BRL is also certified by many other states to perform environmental analyses. For a current list of our accreditations/certifications, please visit our website at <<http://www.brooksrand.com/default.asp?contentID=586>>. Results reported relate only to the samples listed in the report.

Field Quality Control Samples

Please be notified that certain EPA methods require the collection of field quality control samples of an appropriate type and frequency; failure to do so is considered a deviation from some methods and for compliance purposes should only be done with the approval of regulatory authorities. Please see the specific EPA methods for details regarding required field quality control samples.

Common Abbreviations

BLK	method blank	MS	matrix spike
BRL	Brooks Rand Labs	MSD	matrix spike duplicate
BS	laboratory fortified blank	ND	non-detect
CAL	calibration standard	NR	non-reportable
CCV	continuing calibration verification	PS	post preparation spike
COC	chain of custody record	REC	percent recovery
CRM	certified reference material	RPD	relative percent difference
D	dissolved fraction	RSD	relative standard deviation
DUP	duplicate	SCV	secondary calibration verification
ICV	initial calibration verification	SOP	standard operating procedure
MDL	method detection limit	SRM	standard reference material
MRL	method reporting limit	T	total recoverable fraction

Definition of Data Qualifiers

(Effective 9/23/09)

B	Detected by the instrument, the result is > the MDL but ≤ the MRL. Result is reported and considered an estimate.
E	An estimated value due to the presence of interferences. A full explanation is presented in the narrative.
H	Holding time and/or preservation requirements not met. Result is estimated.
J	Estimated value. A full explanation is presented in the narrative.
J-M	Duplicate precision (RPD) for associated QC sample was not within acceptance criteria. Result is estimated.
J-N	Spike recovery for associated QC sample was not within acceptance criteria. Result is estimated.
M	Duplicate precision (RPD) was not within acceptance criteria. Result is estimated.
N	Spike recovery was not within acceptance criteria. Result is estimated.
R	Rejected, unusable value. A full explanation is presented in the narrative.
U	Result is ≤ the MDL or client requested reporting limit (CRRL). Result reported as the MDL or CRRL.
X	Result is not BLK-corrected and is within 10x the absolute value of the highest detectable BLK in the batch. Result is estimated.

These qualifiers are based on those previously utilized by Brooks Rand Labs, those found in the EPA SOW ILM03.0, Exhibit B, Section III, pg. B-18, and the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review; USEPA; January 2010. These supersede all previous qualifiers ever employed by BRL.

Sample Information

Sample	Lab ID	Report Matrix	Type	Sampled	Received
BioReactor 1 Inf	1249041-01	Influent	Sample	12/03/2012	12/07/2012
BioReactor 1 Inf	1249041-02	Influent	Sample	12/03/2012	12/07/2012
BioReactor 1 Inf Hg Blk	1249041-03	DIW	Field Blank	12/03/2012	12/07/2012
BioReactor 1 Inf Hg Blk	1249041-04	DIW	Field Blank	12/03/2012	12/07/2012
BioReactor 2 Inf	1249041-05	Influent	Sample	12/03/2012	12/07/2012
BioReactor 2 Inf	1249041-06	Influent	Sample	12/03/2012	12/07/2012
BioReactor 2 Inf Hg Blk	1249041-07	DIW	Field Blank	12/03/2012	12/07/2012
BioReactor 2 Inf Hg Blk	1249041-08	DIW	Field Blank	12/03/2012	12/07/2012
BioReactor 2 Eff	1249041-09	Effluent	Sample	12/03/2012	12/07/2012
BioReactor 2 Eff	1249041-10	Effluent	Sample	12/03/2012	12/07/2012
BioReactor 2 Eff Hg Blk	1249041-11	DIW	Field Blank	12/03/2012	12/07/2012
BioReactor 2 Eff Hg Blk	1249041-12	DIW	Field Blank	12/03/2012	12/07/2012

Batch Summary

Analyte	Lab Matrix	Method	Prepared	Analyzed	Batch	Sequence
Hg	Water	EPA 1631	12/12/2012	12/17/2012	B122331	1200938

Sample Results

Sample	Analyte	Report Matrix	Basis	Result	Qualifier	MDL	MRL	Unit	Batch	Sequence
BioReactor 1 Inf										
1249041-01	Hg	Influent	T	130		3.79	10.1	ng/L	B122331	1200938
1249041-02	Hg	Influent	D	96.1	H	0.76	2.02	ng/L	B122331	1200938
BioReactor 1 Inf Hg Blk										
1249041-03	Hg	DIW	T	0.15	U	0.15	0.40	ng/L	B122331	1200938
1249041-04	Hg	DIW	D	0.15	H, U	0.15	0.41	ng/L	B122331	1200938
BioReactor 2 Eff										
1249041-09	Hg	Effluent	T	14.0		0.15	0.41	ng/L	B122331	1200938
1249041-10	Hg	Effluent	D	1.46	H	0.15	0.41	ng/L	B122331	1200938
BioReactor 2 Eff Hg Blk										
1249041-11	Hg	DIW	T	0.15	U	0.15	0.40	ng/L	B122331	1200938
1249041-12	Hg	DIW	D	0.15	H, U	0.15	0.40	ng/L	B122331	1200938
BioReactor 2 Inf										
1249041-05	Hg	Influent	T	40.0		0.38	1.01	ng/L	B122331	1200938
1249041-06	Hg	Influent	D	4.10	H	0.15	0.40	ng/L	B122331	1200938
BioReactor 2 Inf Hg Blk										
1249041-07	Hg	DIW	T	0.15	U	0.15	0.40	ng/L	B122331	1200938
1249041-08	Hg	DIW	D	0.15	H, U	0.15	0.41	ng/L	B122331	1200938

Accuracy & Precision Summary

Batch: B122331
Lab Matrix: Water
Method: EPA 1631

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B122331-SRM1	Certified Reference Material (1249026, NIST 1641d 1000x dilution)						
	Hg		15.68	15.81	ng/L	101% 85-115	
B122331-MS1	Matrix Spike (1249039-01)						
	Hg	748.3	2296	2811	ng/L	90% 71-125	
B122331-MSD1	Matrix Spike Duplicate (1249039-01)						
	Hg	748.3	2296	2898	ng/L	94% 71-125	3% 24
B122331-MS2	Matrix Spike (1249040-01)						
	Hg	97.15	505.1	565.8	ng/L	93% 71-125	
B122331-MSD2	Matrix Spike Duplicate (1249040-01)						
	Hg	97.15	505.1	577.4	ng/L	95% 71-125	2% 24

Method Blanks & Reporting Limits

Batch: B122331
Matrix: Water
Method: EPA 1631
Analyte: Hg

Sample	Result	Units			
B122331-BLK1	0.19	ng/L			
B122331-BLK2	0.14	ng/L			
B122331-BLK3	0.15	ng/L			
B122331-BLK4	0.15	ng/L			
Average: 0.16		Standard Deviation: 0.02	MDL: 0.16		
Limit: 0.50		Limit: 0.10	MRL: 0.42		



Instrument Calibration

Sequence: 1200938
Instrument: THG-06(MerxT)
Date: 12/17/2012
Analyte: Hg

Total Mercury and Mercury Speciation by CVAFS
Method: EPA 1631

Lab ID	True Value	Result	Units	REC & Limits	
1200938-IBL1		3.68	pg of Hg		
1200938-IBL2		4.87	pg of Hg		
1200938-IBL3		6.06	pg of Hg		
1200938-IBL4		6.53	pg of Hg		
1200938-CAL1	10.00	10.75	pg of Hg	107%	
1200938-CAL2	25.00	25.35	pg of Hg	101%	
1200938-CAL3	100.0	100.7	pg of Hg	101%	
1200938-CAL4	500.0	488.4	pg of Hg	98%	
1200938-CAL5	2500	2468	pg of Hg	99%	
1200938-CAL6	10000	9492	pg of Hg	95%	
1200938-ICV1	1568	1581	pg of Hg	101%	85-115
1200938-CCB1		8.47	pg of Hg		
1200938-CCV1	500.0	497.3	pg of Hg	99%	77-123
1200938-CCB2		6.70	pg of Hg		
1200938-CCB3		6.11	pg of Hg		
1200938-CCB4		6.33	pg of Hg		
1200938-CCV2	500.0	484.9	pg of Hg	97%	77-123
1200938-CCB5		9.66	pg of Hg		
1200938-CCV3	500.0	483.1	pg of Hg	97%	77-123
1200938-CCB6		5.55	pg of Hg		
1200938-CCV4	500.0	487.8	pg of Hg	98%	77-123
1200938-CCB7		5.79	pg of Hg		
1200938-CCV5	500.0	464.0	pg of Hg	93%	77-123
1200938-CCB8		5.83	pg of Hg		
1200938-CCV6	500.0	464.3	pg of Hg	93%	77-123
1200938-CCB9		5.73	pg of Hg		
1200938-CCV7	500.0	470.5	pg of Hg	94%	77-123
1200938-CCBA		0.44	pg of Hg		
1200938-CCV8	500.0	474.6	pg of Hg	95%	77-123
1200938-CCBB		5.87	pg of Hg		
1200938-CCV9	500.0	475.6	pg of Hg	95%	77-123
1200938-CCBC		5.35	pg of Hg		
1200938-CCVA	500.0	466.3	pg of Hg	93%	77-123
1200938-CCBD		5.08	pg of Hg		

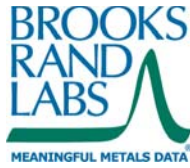
Sample Containers

Lab ID: 1249041-01		Report Matrix: Influent		Collected: 12/03/2012	
Sample: BioReactor 1 Inf		Sample Type: Sample		Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot
A	Bottle FLPE Hg-T	500 mL	71666330	none	n/a
			10		
					pH
					Ship. Cont.
					Cooler
Lab ID: 1249041-02		Report Matrix: Influent		Collected: 12/03/2012	
Sample: BioReactor 1 Inf		Sample Type: Sample		Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot
A	Bottle FLPE Hg-T	500 mL	71666330	none	n/a
			10		
					pH
					Ship. Cont.
					Cooler
Lab ID: 1249041-03		Report Matrix: DIW		Collected: 12/03/2012	
Sample: BioReactor 1 Inf Hg Blk		Sample Type: Field Blank		Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot
A	Bottle FLPE Hg-T	500 mL	71666330	none	n/a
			10		
					pH
					Ship. Cont.
					Cooler
Lab ID: 1249041-04		Report Matrix: DIW		Collected: 12/03/2012	
Sample: BioReactor 1 Inf Hg Blk		Sample Type: Field Blank		Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot
A	Bottle FLPE Hg-T	500 mL	71666330	none	n/a
			10		
					pH
					Ship. Cont.
					Cooler
Lab ID: 1249041-05		Report Matrix: Influent		Collected: 12/03/2012	
Sample: BioReactor 2 Inf		Sample Type: Sample		Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot
A	Bottle FLPE Hg-T	500 mL	71666330	none	n/a
			10		
					pH
					Ship. Cont.
					Cooler
Lab ID: 1249041-06		Report Matrix: Influent		Collected: 12/03/2012	
Sample: BioReactor 2 Inf		Sample Type: Sample		Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot
A	Bottle FLPE Hg-T	500 mL	71666330	none	n/a
			10		
					pH
					Ship. Cont.
					Cooler

Sample Containers

Lab ID: 1249041-07			Report Matrix: DIW			Collected: 12/03/2012	
Sample: BioReactor 2 Inf Hg Blk			Sample Type: Field Blank			Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler
Lab ID: 1249041-08			Report Matrix: DIW			Collected: 12/03/2012	
Sample: BioReactor 2 Inf Hg Blk			Sample Type: Field Blank			Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler
Lab ID: 1249041-09			Report Matrix: Effluent			Collected: 12/03/2012	
Sample: BioReactor 2 Eff			Sample Type: Sample			Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler
Lab ID: 1249041-10			Report Matrix: Effluent			Collected: 12/03/2012	
Sample: BioReactor 2 Eff			Sample Type: Sample			Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler
Lab ID: 1249041-11			Report Matrix: DIW			Collected: 12/03/2012	
Sample: BioReactor 2 Eff Hg Blk			Sample Type: Field Blank			Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler
Lab ID: 1249041-12			Report Matrix: DIW			Collected: 12/03/2012	
Sample: BioReactor 2 Eff Hg Blk			Sample Type: Field Blank			Received: 12/07/2012	
Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Project ID: DUK-HV1201
PM: Tiffany Stilwater



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Client PM: Jay Perkins
Client PO: 141391

Shipping Containers

Cooler


Received: December 7, 2012 9:45
Tracking No: 5353 0519 6626 via FedEx
Coolant Type: Ice
Temperature: 2.6 °C

Description: Cooler
Damaged in transit? No
Returned to client? No

Custody seals present? No
Custody seals intact? No
COC present? Yes

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

1249041
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			Duke Energy Analytical Laboratory Mail Code MGO3A2 (Building 7405) 13339 Hagers Ferry Rd Huntersville, N. C. 28078 (704) 875-5245 Fax: (704) 875-4349		
1) Project Name Belews Creek (Flex Fuel) - WW		2) Phone No:			
2) Client: Melanie Martin, Wayne Chapman, Tom Johnson, Bill Kennedy		4) Fax No:			
5) Project: MBCFFLX01		6) Account:		Mail Code:	
8) Oper. Unit: BC01		9) Process: NEXHSTK		10) Activity ID:	

Analytical Laboratory Use Only			
LIMS # 51212076	Matrix: OTHER	Samples Originating From: NC	SC
Logged By: Cpk	Date & Time: 12-4-12 1021	SAMPLE PROGRAM Ground Water NPDES	
Vendor: ASC, Brooks Rand		Drinking Water	Waste
Cooler Temp (C): 1.6		UST RCRA	

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DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer to complete all appropriate non-shaded areas.					16 Analyses Required		17 Comp.		18 Grab		TDS, TSS		Hg 1631 total and filtered V Brand		Metals + Hg 245.1*		Mn (ICP), Se (IMS) filtered		Se, Speciation, V_ASC		Chloride, Sulfate, Bromide, - Dionex	
ID	13 Sample Description or ID	Date	Time	Signature	17 Comp.	18 Grab	TDS, TSS	Hg 1631 total and filtered V Brand	Metals + Hg 245.1*	Mn (ICP), Se (IMS) filtered	Se, Speciation, V_ASC	Chloride, Sulfate, Bromide, - Dionex										
	FGD Purge Eff	12-3	0700	Larry Turner			1		1	1	1	1										
	EQ Tank		0735						1	1												
	BioReactor 1 Inf		0740					1	1*	1	1											
	BioReactor 1 Inf Hg Blk		0740					1														
	BioReactor 2 Inf		0745					1	1*	1	1											
	BioReactor 2 Inf Hg Blk		0745					1														
	BioReactor 2 Eff		0750					1	1*	1	1	1										
	BioReactor 2 Eff Hg Blk		0750					1														
	Filter Blank		0755							1												
Filter Mn and Se in the field																						
1 6564 2																						

Lab, return kit to Tom Johnson **Cpk 12-4**

LAB USE ONLY	
11 Lab ID	
2012025801	
03	
04	
05	
06	
07	
08	
09	
10	

Customer to sign & date below - fill out from left to right.

1) Relinquished By Larry Turner	Date/Time 12-3-12 0830	2) Accepted By Cpk	Date/Time 12-4-12
5) Relinquished By	Date/Time	4) Accepted By [Signature]	Date/Time 12/7/12 0945
5) Relinquished By	Date/Time	6) Accepted By	Date/Time
7) Relinquished By Cpk	Date/Time 12-6-12	8) Accepted By	Date/Time
9) Seal/Locked By Cpk	Date/Time 12-6-12	10) Seal/Lock Opened By	Date/Time
11) Seal/Locked By	Date/Time	12) Seal/Lock Opened By	Date/Time
Comments			

* Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, Fe, Mg, Mn * No Hg 245.1

Customer, IMPORTANT!
Please indicate desired turnaround.

22 Requested Turnaround
21 Days X
7 Days
48 Hr
*Vendor Lab 13 Days X
12-20-12

